Abstract

Background and Aim

Root canal therapies are of the most prevalent treatments in dentistry which should be done accurately by the dentists and endodontists. In addition, the incidence of iatrogenic errors make the prognosis of the treatments poorer, however, some of them are unavoidable. This study assessed the quality of endodontic treatments and the incidence of iatrogenic errors in these treatments perfomed by the dentists of Ardabil city by means of cone-beam computed tomography (CBCT) on 2018.

Materials and Methods

In a descriptive cross-sectional trial, 328 patients (182 females, 146 males) having CBCT images of their mandibular molars (90 right 1st molar, 80 left 1st molars, 72 right 2nd molars and 86 left 2nd molars) taken at 2 private radiology centers at Ardabil city were included. The patients' mandibular molars have received root canal therapies. Mandibular molars were assessed on the sagital, coronal and axial dimensions of CBCTs regarding iatrogenic errors of underfilling, overfilling, filling density, unknown canals, broken instrument, apical perforation, strip perforation, ledge, transportation, root fracture, root resorption, and the presence of apical lesions. The assessments were done by a final year dental student under the supervision of a radiologist and an endodontist. The frequency and percent of the errors were reported totally and regarding their incidence in different canals of the molars. The errors' prevalence were statistically analyzed by chi-square test in terms of patients' gender and molar types.

Results

Underfilling was seen in 144 (34.8%) teeth while the errors of undiscovered canal, overfilling, filling density, apical perforation, transportation, ledge, broken instrument, root fracture and strip perforation were seen in 57(17.4%), 55(16.8%), 47(14.3%), 24(7.3 %), 20(6.1%), 14 (4.3%), 10(3.0%), 4(1.2%) and 2 (0.06%) respectively. Furthermore, the symptoms of root resorption and apical lesions were seen in 18 (5.5%) and 151 (46.0%).

The incidence of root fracture in females was higher than males (2.7% vs. 0%; $p<0.05$) while no other significant differences were noted regarding the incidence of other iatrogenic errors between males and females. Again, different significant rates of iatrogenic errors were seen in right and left 1st

molars and also right and left 2nd molars regarding underfilling (37.8%, 20.0%, 47.2 % anmd 34.9%; p<0.005); undiscovered canal (13.3%, 12.5%, 30.6% and 15.1%; p<0.01) and transport (10.0%, 3.8%, 9.7% and 1.2%; p<0.04). No other significant differences were noted about other iatrogenic errors among molars types.

Conclusion

The most prevalent iatrogenic errors in the root canal treatments done in the mandibular permanent molars were underfilling, undiscovered canal and overfilling. In order to decrease the frequency of these errors, it is necessary for the dentists to receive more education in this field and improve the quality of their treatments.

Keywords

Iatrogenic errors, Cone-beam computed tomography (CBCT), Mandibular molars